

## WHAT IS CLAIMED IS:

1. A pinned hinge suitable for continuous hinge applications, the hinge comprising:

a first hinge member including at least one first knuckle and a first longitudinally-extending leaf connected thereto, the first leaf including a pair of parallel spaced-apart longitudinally-extending base portions and a longitudinally-extending mounting portion disposed therebetween, the mounting portion offset and parallel to the base portions, the mounting portion defining a longitudinally-extending cavity between the base portions, a first plurality of holes defined by the mounting portion and spaced along a first longitudinal axis, a second plurality of holes defined by the mounting portion and spaced along a second longitudinal axis, at least one each of the first and the second plurality of holes having an annular reinforcement disposed proximate to the hole in the cavity and extending outwards from the mounting portion, the mounting portion and reinforcement further defining a conical surface extending through the mounting portion and reinforcement around the periphery of the hole;

a second hinge member including at least one second knuckle and a second longitudinally extending leaf connected thereto; the second leaf including a pair of parallel spaced-apart longitudinally-extending base portions and a longitudinally-extending mounting portion disposed therebetween, the mounting portion offset and parallel to the base portions, the mounting portion defining a longitudinally-extending cavity between the base portions, a third plurality of holes defined by the mounting portion and spaced along a third longitudinal axis, a fourth plurality of holes defined by the mounting portion and spaced along a fourth longitudinal axis, at least one each of the third and the fourth plurality of holes having an annular reinforcement disposed proximate to the hole in the cavity and extending outwards from the mounting portion, the mounting portion and reinforcement further defining a conical surface extending through the mounting portion and reinforcement around the periphery of the hole; and

a pin received through the first and second knuckles to pivotably connect the first and second hinge members.

2. The hinge of claim 2, wherein the first and second hinge members have a total width measured from outside of the first leaf to the outside of second leaf of about 5/16

inches when the hinge is in a closed position with both mounting portions facing and substantially parallel to each other.

3. A hinge suitable for continuous hinge applications, the hinge comprising:

at least one first longitudinally-extending leaf having a length and including a base portion having a surface and a thickness, and at least one mounting portion having a first surface and a second surface with a thickness defined therebetween, the first mounting portion surface offset and parallel to the base portion surface; and

at least one hole defined by the mounting portion between the first surface and the second surface, the hole having a conical surface.

4. The hinge of claim 3, wherein the thickness of the mounting portion is about the same as the thickness of the base portion.

5. The hinge of claim 3, wherein the mounting portion further defines a cavity below the mounting portion.

6. The hinge of claim 3, wherein the mounting portion is configured as a longitudinally-extending rail extending along substantially the entire length of the leaf.

7. The hinge of claim 3, wherein the leaf further comprises a plurality of mounting portions spaced intermittently along the length of the leaf.

8. The hinge of claim 7, wherein the plurality of mounting portions are elongated and oriented angularly with respect to an edge extending longitudinally along the length of the leaf.

9. The hinge of claim 3, wherein the leaf defines at least five longitudinally-spaced-apart conical holes disposed along the length of the leaf.

10. The hinge of claim 3, further comprising:  
a second longitudinally-extending leaf pivotally connected to the first leaf, the second leaf having a length and including a base portion having a surface and a thickness, and at least one mounting portion having a first surface and a second surface with a thickness defined therebetween, the first mounting portion surface offset and parallel to the base portion surface; and

at least one hole defined by the mounting portion of the second leaf between the first surface and the second surface, the hole having a conical surface.

11. The hinge of claim 3, wherein the leaf is made of steel.

12. A hinge suitable for continuous hinge applications, the hinge comprising:

at least one first longitudinally-extending leaf mountable to a hinged object, the leaf having a length and including a base portion having a substantially flat surface and a thickness, and at least one mounting portion having a thickness defined between a substantially flat first surface and a second surface, the first mounting portion surface offset and parallel to the base portion surface;

at least one hole defined by the mounting portion between the first surface and the second surface, the hole having a conical surface; and

an annular reinforcement disposed on the second surface of the mounting portion proximate to the hole, the reinforcement extending outwards from the second surface.

13. The hinge of claim 12, wherein the mounting portion and base portion defines a cavity below the second surface of the mounting portion, the annular reinforcement disposed in the cavity.

14. The hinge of claim 13, wherein the annular reinforcement extends outwards to a plane defined by the base portion surface, the base portion and reinforcement contacting the hinged object when the hinge leaf is mounted thereto.

15. The hinge of claim 12, wherein the conical hole surface extends into the annular reinforcement.

16. The hinge of claim 15, wherein the conical surface has a depth sufficient to fully receive and support a majority of a side surface of a conical head of a standard No. 12 undercut flat head mounting screw dimensioned per American Society of Mechanical Engineers National Standard ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999,

whereby the top of the screw may be installed substantially flush with the top of the first surface of the mounting portion when the leaf is mounted to the hinged object.

17. The hinge of claim 12, wherein the annular reinforcement has a flattened top for abutting the hinged object when the leaf is mounted thereto.

18. The hinge of claim 17, wherein the annular reinforcement is work hardened.

19. The hinge of claim 12, wherein the combined thickness through the mounting portion and the reinforcement is greater than the thickness of the mounting portion.

20. The hinge of claim 12, wherein the mounting portion is configured as a raised longitudinally-extending rail extending along substantially the length of the leaf.

21. The hinge of claim 20, wherein the base portion further comprises a width and the mounting portion further comprises a width, the width of the mounting portion greater than 50% of the width of base portion.

22. The hinge of claim 12, further comprising a first plurality of holes with reinforcements spaced along a first longitudinal axis of the leaf.

23. The hinge of claim 22, further comprising a second plurality of holes with reinforcements spaced along a second longitudinal axis of the leaf spaced apart from the first longitudinal axis.

24. The hinge of claim 12, further comprising:  
a second longitudinally-extending leaf pivotally connected to the first leaf and mountable to a hinged object, the second leaf having a length and including a base portion having a substantially flat surface and a thickness, and at least one mounting portion having a thickness defined between a substantially flat first surface and a second surface, the first mounting portion surface offset and parallel to the base portion surface;

at least one hole defined by the mounting portion of the second leaf between the first surface and the second surface, the hole having a conical surface; and

an annular reinforcement disposed on the second surface of the mounting portion of the second leaf proximate to the hole, the reinforcement extending outwards from the second surface.

25. A hinge suitable for continuous hinge applications, the hinge comprising:

a first longitudinally-extending leaf, the first leaf including a substantially flat base portion and at least one substantially flat mounting portion offset and parallel to the base portion to define a cavity between the mounting portion and the base portion;

a longitudinally-extending joining member pivotably connected to the first longitudinally-extending leaf;

a second longitudinally-extending leaf pivotably connected to the longitudinally-extending joining member; and

means for supporting a majority of a side surface of a head of a standard No. 12 undercut flat conical head screw dimensioned per American Society of Mechanical Engineers National Standard ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999, when at least a portion of the head of the screw is in the cavity.

26. The hinge of claim 25, wherein the securing means includes a hole defined by the mounting portion and an annular reinforcement disposed in the cavity and proximate to the hole, the annular reinforcement and mounting portion defining a conical surface with respect to an axis of the hole, the conical surface extending through the mounting portion into the reinforcement, the conical surface having a depth substantially the same as the depth of the standard No. 12 undercut flat conical head screw.

27. The hinge of claim 25, wherein the depth of the conical surface is from about 0.078 inches to about 0.092 inches.

28. The hinge of claim 25, wherein the first and second leaves each further comprise at least one knuckle, and wherein the joining member is a longitudinally-extending pin received in the knuckles to pivotably connect the first and second leaves.

29. The hinge of claim 25, wherein the first and second leaves each further comprise a longitudinally-extending edge, and wherein the joining member is a

longitudinally-extending clamp pivotably engaging the longitudinally-extending edges of the first and second leaves.

30. The hinge of claim 25, wherein the means for supporting a majority of a side surface of the head supports at least 75% of the side surface of the head.

31. A method of securing a hinge leaf to an object using fasteners, the method comprising:

placing a first hinge leaf against an object, the first leaf having a base portion with a substantially flat surface and a mounting portion having a surface offset and parallel to the base portion; the mounting portion further defining a cavity between the mounting portion and the object;

inserting at least one conical flat head fastener through at least one hole defined by the mounting portion, the hole circumscribed by an annular reinforcement disposed in the cavity proximate to the hole, the mounting portion and reinforcement further defining a conical surface around the periphery of the hole;

embedding the fastener in the object; and

supporting a majority of a side of the conical head of the fastener against the conical surface.

32. The method of claim 31, wherein the fastener is a standard No. 12 undercut conical flat head screw dimensioned per American Society of Mechanical Engineers National Standard ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999.

33. A method of fabricating a hinge leaf with reinforced holes capable of accepting a conical flat head fastener, the method comprising:

forming a raised portion in the leaf having an underside to define a cavity therebelow;

forming a hole with conical sidewalls in the raised portion configured to receive a conical head fastener for mounting the leaf to a hinged object; and

deforming the raised portion at the hole to form an annular reinforcement on the underside of the raised portion around the hole in the cavity.

34. The method of claim 33, wherein the steps of forming the hole and reinforcement are completed in a single machining step.

35. The method of claim 33, wherein the hole and reinforcement are formed by embossing.

36. The method of claim 35, wherein the step of forming the reinforcement further comprises forcing the raised portion into a die button placed on the underside of the raised portion.

37. The method of claim 36, further comprising forming a flattened top on the reinforcement by forcing the raised portion into the die button.

38. The method of claim 33, further comprising the step of flattening a top of the reinforcement.

39. The method of claim 33, wherein the step of forming the hole further comprises forming a conical sidewall on the hole.

40. The method of claim 33, wherein the raised mounting portion is configured as a longitudinally-extending rail disposed along substantially the entire length of the leaf material.

41. The method of claim 33, wherein the fastener is a standard No. 12 undercut conical flat head screw dimensioned per American Society of Mechanical Engineers National Standard ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999.

42. A method of making a hinge leaf comprising:  
forming a cavity in a hinge leaf having a thickness and an underside;  
forming at least one conical fastener hole through the leaf that communicates with the cavity; and  
reinforcing the underside of the leaf in the cavity around the hole.

43. The method of claim 42, wherein reinforcing the leaf includes locating at least one reinforcement having a thickness in the cavity proximate to the hole so that the combined leaf and reinforcement have a thickness greater than the thickness of the leaf alone.

44. A method of making a hinge leaf comprising:  
forming a cavity in a hinge leaf having a thickness;

forming at least one conical fastener hole in the leaf communicating with the cavity; and

locating at least one reinforcement having a thickness in the cavity proximate to the hole so that the leaf and reinforcement have a combined total thickness at least about the same as a height of a head of a standard No. 12 undercut conical flat head screw dimensioned per American Society of Mechanical Engineers National Standard ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999.

45. A method of installing a hinge leaf to a hinged object, the method comprising:

forming a cavity between a hinge leaf and a hinged object;

locating a conical fastener head having a depth in the cavity and hinge leaf;

and

supporting substantially the entire depth of the conical fastener head in the leaf and cavity.

46. A method of installing a hinge leaf to a hinged object, the method comprising:

forming a cavity between a hinge leaf and a hinged object;

locating a conical fastener head having a depth of a standard No. 12 undercut conical flat head screw dimensioned per American Society of Mechanical Engineers National Standard ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999; and

supporting a majority of the depth of the conical fastener head in the leaf and cavity.

47. A hinge suitable for continuous hinge applications, the hinge comprising:

at least one longitudinally-extending leaf having a length and including a base portion having an underside and a thickness, and at least one raised mounting portion having an underside and a thickness, the underside of the mounting portion surface offset and parallel to the underside of the base portion surface to define a cavity having a depth;



at least one hole disposed in the raised mounting portion to attach the leaf to a hinged object, the hole having a conical surface; and

a reinforcing ring having a thickness disposed on the underside of the raised mounting portion around the hole, the ring extending radially outwards from and perpendicular to the underside of the mounting portion,

wherein a combined thickness through the raised mounting portion and ring is greater than the thickness of the raised portion.

48. The hinge of claim 47, wherein the combined thickness through the mounting portion and ring is greater than the thickness of the raised mounting portion.

49. The hinge of claim 47, wherein the ring has a flattened top, the flattened top aligned substantially parallel with the underside of the base portion, whereby the flattened top and the base portion simultaneously abut the hinged object when the leaf is placed against the hinged object in a mounting position.

50. The hinge of claim 47, wherein the ring is formed as an integral part of the mounting portion.

51. The hinge of claim 47, wherein the depth of the cavity is about the same as the thickness of the reinforcing ring.

52. A hinge suitable for continuous hinge applications, the hinge comprising:

at least one first longitudinally-extending leaf mountable to a hinged object, the leaf having a length and including a base portion having a substantially flat surface and a thickness, and at least one mounting portion having a thickness defined between a substantially flat first surface and a second surface, the first mounting portion surface offset and parallel to the base portion surface;

at least one hole defined by the mounting portion between the first surface and the second surface, the hole having a conical surface; and

an annular reinforcement having a thickness and disposed on the second surface of the mounting portion proximate to the hole, the reinforcement and mounting portion having a combined total thickness sufficient to substantially flushly mount with the first surface a head of a standard No. 12 undercut conical flat head screw dimensioned per American Society of Mechanical Engineers National Standard

ASME B18.6.4-1998, entitled "Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)" issued December 31, 1999.